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Method of Producing Laminate Coatings and the Laminate Coating

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The invention relates to a method of producing laminate coatings, which are suitable for, and designed in particular for, floor tiles, and which comprise a decorative paper impregnated with an amino resin and a wear-resistant covering layer or coating applied thereon with a particulate fine
10 aluminium oxide (corundum). The invention also relates to such a laminate coating.

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It is known (DE 195 08 797 C 1), to produce wear-resistant laminate coatings for floor tiles in such a way that, onto the visible surface of a decorative paper, after steeping of the latter in resin and drying to a residual moisture content, a wear-resistant mineral component having fine particle size comprising a viscous mixture of melamine resin, cellulose fibres, corundum, and additives and water is applied in such quantity that
20 a after the attainment of the final moisture content the coating has a thickness of 20 to 50 μ -m, whereupon the resulting coated decorative sheet is dried to the final moisture content in at least one further working step.

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In this known process there is applied to the paper, steeped in melamine resin and dried, a viscous mixture which contains the fine-particle aluminium oxide or corundum which determines the wear resistance of the finished product. The fine particle corundum particles are distributed more or less uniformly in the covering layer formed of the viscous mixture and accordingly are also present on the surface of the covering
30 layer.

It is further known to produce laminate coatings for floor tiles in such a way that on the upper or visible face of a decorative paper impregnated with amino resin or melamine resin there is applied an overlay which has
5 on the upper surface of a substrate made of paper the fine particles of aluminium oxide or corundum which provide the wear resistance.

These two known processes require two separate method steps, namely on the one hand the manufacture of a separate mixture containing the
10 corundum particles and the application of it, and on the other hand the production of a separately applied overlay. To this extent these known processes are relatively expensive and thereby hardly economical.

A further and significantly more important drawback lies in (the fact that
15 pressing plates or pressing bands used for the mechanical production of the laminate coatings are damaged by abrasion by the corundum particles present on the surface of the laminate, which leads to a relatively rapid dulling of the surface of the finished laminate coatings.) Accordingly the pressing plates or pressing bands made of sheet metal used when applying
20 the known manufacturing technique have to have their surfaces machined or ground relatively frequently in order to compensate for dulling of their surfaces. The running time of the pressing plates or pressing strips is accordingly relatively short.

25 The machining of the surfaces of the pressing plates or pressing bands not only gives rise to high machining costs but also to down times of the correspondingly equipped presses, which has a negative influence on the economy of the wear-resistant production of the laminate coatings.

The invention is based on solving the problem of making the manufacture of wear-resistant laminate coatings more economical than hitherto.

- 5 This problem is solved according to the invention by a process having the features of Claim 1.

Preferred embodiments of the invention are the subject of the other claims.

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According to the present invention a laminate coating for floor tiles or similar uses can be produced in one step, the particles of aluminium oxide or corundum which produce the wear resistance of the laminate coating being encapsulated ^{with} (on the surface of) the coating in such a way that they cannot damage the pressing plates or pressing bands of the machines or presses used for producing the laminate coatings.

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The material covering layer of fibre material containing melamine resin applied to the impregnated decorative paper after the spreading of the particulate aluminium oxide is (transparent,) so that the pattern on the decorative paper is clearly visible. On account of the covering of the particles which produce the wear resistance of the end product during the manufacture of the laminate coating a dulling and thereby damage to the surface of the laminate coating produced is not to be expected even after long periods of use of the pressing plate or pressing bands of the machine or process.

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In other words the surface of the laminate coating produced in accordance with the invention remains clear because (the fibre fleece applied as encapsulation for the corundum particles) does not alter or adversely affect

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the visibility of the pattern on the paper, but on the other hand protects the pressing plates or pressing bands of the presses or other production machines used for the manufacture of the laminate coating against premature wear.

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The laminate coatings according to the invention could for example be applied to plywood sheets or fibre tiles which have been previously provided on the top surface and/or the lower surface respectively with a backing layer designed to resist removal.

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The invention is further explained in conjunction with two embodiments by way of example.

Example 1:

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A decorative or patterned paper having an area density of 70 g/m^2 is first steeped in melamine resin in an immersion bath, the density amounting to 140 g/m^2 after drying. Corundum is spread onto the still damp paper web in a quantity of 20 g/m^2 .

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The paper is then subjected to an intermediate drying step at a temperature of 180°C to bring it to a moisture content of 15%.

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There is then applied to this paper web (a fibre fleece having a density of 80 g/m^2 comprising 80 % melamine resin and 20 % (cellulose fibres) having a length of $60 \mu\text{-m}$.) The final drying then takes place at 180°C to a moisture content of 6.0. to 6.5 %.

The impregnate thus produced is pressed in a short stroke press at a temperature of 205° C, a specific pressure of 2.5 MPa and a pressing time of 20 s to produce an HDF supporting plate.

- 5 The laminate floor covering thus obtained fulfils the requirements of the standard EN 438 and has a wear value IP of 10,000.

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Example 2:

A patterned paper having a density of 80 g/m^2 is steeped in a melamine resin, the density after the subsequent drying amounting to a 150 g/m^2 . Fine-particle aluminium oxide is spread on the still damp paper web in a quantity of 8 g/m^2 . The paper web is then dried at 210°C to a moisture content of 12 %. Subsequently (a fleece of 40 g/m^2 , comprising 85 % melamine resin and 15 % (glass fibres) having a length of 3 mm and a diameter of $10 \text{ }\mu\text{-m}$ is applied.) The further procedure corresponds to Example 1.